

Notice of Allowability

Application No.

10/708,227

Examiner

Toniae M. Thomas

Applicant(s)

LEE ET AL.

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the election filed on 14 July 2004.
2. ☒ The allowed claim(s) is/are 1-18.
3. ☒ The drawings filed on 18 February 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 02/18/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

Election/Restrictions

1. Applicant's election **without** traverse of Group I, claims 1-8, in the reply filed on 14 July 2004 is acknowledged.
2. Also, in the reply filed on 14 July 2004, the Applicant cancelled claims 19-24 "without waiver, prejudice or disclaimer," the claims being drawn to a nonelected invention. Since it is believed that Applicant's intention was to cancel all claims belonging to the invention of Group II, claims 19-28 have been cancelled via the examiner's amendment below.¹

Amendment

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

In Specification

At paragraph 005, line 1, "non-volatile" has been changed to -
--volatile-- after "type of";

At paragraph 0015, line 10, "106" has been changed to --104--
after "mask layer";

¹ In the restriction requirement mailed on 18 June 2004, the examiner indicated inadvertently that the invention of Group II includes claims 19-24. However, this is incorrect. The invention of Group II includes claims 19-28.

At paragraph 0017, line 21, “oneach” has been changed --on
each--;

At paragraph 0018, line 2, “are” has been changed to --is--
after “104”;

At paragraph 0018, line 7, “than” has been deleted after
“above”;

At paragraph 0019, line 5, “serves” has been changed to
--serve-- after “126”;

At paragraph 0024, line 15, “position” has been changed to
--positioned--

At paragraph 0024, line 29, “regionadjacent” has been changed
to --region adjacent” after “channel”.

In Claims

Claims 19-28 have been cancelled.

Reasons for Allowance

The following is an examiner’s statement of reasons for allowance: the prior art of record fails to anticipate, teach, or suggest – either when considered separately or when combined - a process for fabricating a dynamic random access memory (DRAM) substantially as claimed. For example, the Hsu et al. patent (Hsu) discloses a method for fabricating a DRAM (figs. 7, 8, 9, and col. 3, line 66 – col. 4, line 53). The method comprises the steps of: providing a substrate; forming a plurality of trenches in the substrate; forming a capacitor

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inside each trench; patterning a plurality of active regions on the substrate; forming a plurality of word lines on the substrate; forming a pair of source/drain regions in each active region; and forming a plurality of bit lines over the substrate (fig. 8 and col. 4, lines 23-33). Hsu further discloses: a first side edge of each active region having a first trench whose capacitor is coupled to the active region; and a second side edge of an adjacent active region having a second trench such that a word line passes through both the active region and the second trench, wherein the area in the active region covered by the word line serves as a channel region, and wherein the source/drain regions of each active region are electrically connected to a capacitor and a bit line (fig. 8 and col. 4, lines 23-33). Whereas Hsu discloses forming trenches in the substrate and patterning the active regions, Hsu differs from the claimed invention in that Hsu does not anticipate, teach, or suggest performing an ion implantation tilted at an angle along the word line direction -after forming the trenches, but prior to patterning the active regions – to form a doped region on each side of the channel region in the substrate, such that the dopants within the doped regions have a conductive type identical to that of the substrate. There is no teaching or suggestion within the other prior art references of record to modify Hsu by performing an ion implantation as in the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should

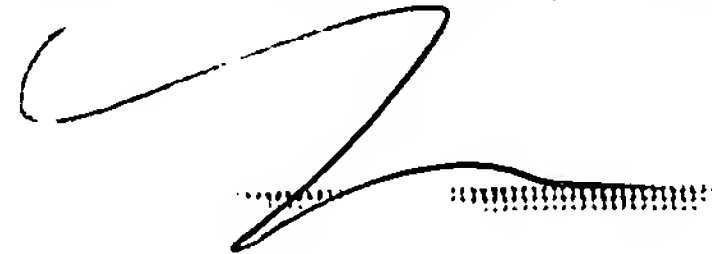
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preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 a.m. to 5:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MMJ

03 September 2004

Mary Wilczewski
Primary Examiner